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Magnet Division Procedure

Procedure: SMD-RHIC-RD9001

Revision: A



Repair of CQS Magnet Assembly CQS296

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Revision History

Rev. A Initial Release 4/3/02

1 Scope:

Outlined herein are the required steps to disassemble this model 54 CQS unit in order to gain access to the defective corrector coil.

2 Applicable Documents:

Radiological Work Permit (RWP)
CQS Model 54 Top Assembly Drawing 12100002-54

3 Requirements:

3.1 Material

None

3.2 Safety Precautions

3.2.1 Radioactive training requirements shall be performed per the associated RWP.

NOTE

A copy of the RWP shall be signed by all personnel entering the controlled area and be posted at the control boundary.

NOTE

Only Radiological Controls Personnel are allowed to move/remove controlled area postings and boundary and to release material from the control area.

3.2.2 Radioactive area access requirements shall conform to the associated RWP.

3.2.3 Radioactive cleanliness requirements shall conform to the associated RWP.

3.2.4 All lifting and handling operations requiring overhead crane operations shall be performed by holders of valid Safety Awareness Certificates. They shall also be instructed in the use of the appropriate lifting device by the Technical Supervisor.

3.2.5 Hard hats are required during crane operations.

4 Procedure

4.1 Remove covers from power lead terminal assembly. Unsolder leads from terminals of feed-thru. Then disassemble and remove the entire terminal box

assembly and cross from mounting flange. Leave all leads wires/cables protruding straight up in preparation for being pulled through the flex line later.

NOTE

The B.A.G. terminal assembly on the top right side of the cryostat shall be left intact. It need not be disassembled to perform this work.

- 4.2 Using a Saws-All, sever the end of the beam tube with the Conflat flange by cutting through the tube one inch from the face of the lead end volume (non-BPM end). Run the saw at low speed and use cutting oil sparingly to reduce splatter. Ensure that all cuttings are collected and treated as potentially radioactive waste. Have Radiological Controls Personnel survey and tag the beam tube stub and flange. Then set it aside for reuse.
- 4.3 Free the beam tube from the end volume flange using a WACHS cutter. Only remove material from the end volume flange to break the seal weld. Avoid cutting into the OD of the beam tube since it must be reused. Ensure all cuttings are collected and treated as potentially radioactive waste.
- 4.4 Using a WACHS cutter, sever the lead end volume from the end plate. Pry it free from the end plate and slide it off the beam tube. Use a suitable jack, support stand, or die table to support the end volume from its underside. Do not allow it to hang by its full weight on the beam tube unless the beam tube is, in turn, supported at its lead end.

NOTE

Have Radiological Controls Personnel sample/survey end volume material to ensure radiological controls are appropriate.

- 4.5 Disassemble the quadrupole electro-mechanical hardware: Remove the diode and bracket. Remove the quad and dipole bus retainers. Disconnect the leads from the half-moon terminal board. Then unscrew the board from the stand-off mounts. Remove the G-10 splice housing pieces from the bus splices and flex joint splices. Remove all harness straps and KEVLAR strain relief ties. Unsolder the four warm-up heater leads from the heaters terminals. Unwrap kapton insulation and fiberglass insulation where necessary. Remove the aluminum backing plate from the end plate.

NOTE

Have Radiological Controls Personnel sample/survey area to ensure radiological controls are appropriate.

- 4.6 Detach all wires harnesses that are tied to the flex joint. Then unsolder and remove the flex joint assembly and associated hardware.
- 4.7 Unsolder the extension bus-to-quad bus splice.
- 4.8 Pull the quad bus conductors out from the lead end leaving the pultrusion in place.
- 4.9 At the extension bus, unsolder and separate the superconductors from the copper stabilizer bars. Avoid over-bending the superconductors since when permeated with solder they are easily overstressed.
- 4.10 Bend the extension bus stabilizer bars outward and only enough to clear the corrector coil assembly when it is pulled straight out.
- 4.11 Pull the lead harness through flex hose from the end plate end.
- 4.12 Unsolder and remove the lead harness and half-moon terminal board assembly from the magnet, leaving it as intact as possible. It will be reconditioned and reused later.
- 4.13 Cut the flex hose neatly from end plate by breaking the inside weld to the face of the end plate. Drilling is recommended. No grinding is permissible. Cutting the hose flush with the rear face of the end plate will also suffice. However, a short stub will have to be welded onto the hose during reassembly.

NOTE

Have Radiological Controls Personnel sample/survey end volume material to ensure radiological controls are appropriate.

- 4.14 Using a WACHS cutter, sever and remove the lead end plate from the shell by cutting the fillet weld. Leave a suitable weld prep remaining on the end of the shell for future end plate installation.

NOTE

Have Radiological Controls Personnel sample/survey end plate material to ensure radiological controls are appropriate.

- 4.15 Unsolder and detach corrector terminal board and lead harness from the lead end of the corrector.
- 4.16 Detach corrector coil set from the yoke and slide it out the lead end.

5 Quality Assurance Provisions:

- 5.1 The Quality Assurance provisions of this procedure require that all assembly and test operations be performed in accordance with the procedural instructions contained herein.
- 5.2 Measuring and test equipment used for this procedure shall contain a valid calibration label in accordance with RHIC-MAG-Q-1000.
- 5.3 All discrepancies shall be identified and reported in accordance with RHIC-MAG-Q-1004.